PB85-213643

Superfund Record of Decision (EPA Region 1)
Western Sand and Gravel Site
Burrillville, Rhode Island, September 1984

(U.S.) Environmental Protection Agency
Washington, DC

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U.S. Department of Commerce
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Office of
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EPA

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Western Sand & Gravel Site, RI

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15. SUPPLEMENTARY NOTES		

16. ABSTRACT

This semi-rural site has been a sand and gravel mining operation owned by Western Sand and Gravel, Inc., since 1953. In 1975 approximately 12 acres of the 20-acre site were used for the disposal of 480,000 gallons of liquid wastes, including chemicals and sewage waste. These wastes were dumped into unlined lagoons and seepage pits. Ground water contamination has occurred at the site and a plume of contamination is moving towards domestic wells adjacent to the site.

The selected cost-effective remedial alternative includes: the installation of a permanent alternate water supply to service approximately 56 parcels of land, and the installation of carbon canister filters as a temporary abatement measure for 8 homes with contaminated wells until the permanent water supply is functional.

Key Words: Cost Factors; Fire Protection; Water Supply System; Alternate Concentration Limit (ACL); Ground Water Contamination; RCRA; Enforcement; Negotiated Settlement; Ground Water Cleanup; Ground Water Strategy

17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Western Sand & Gravel Site, RI Contaminated media: gw, soil Key contaminants: VOCs, solvents, TCE, acids		

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ROD ISSUES ABSTRACT

Site: Western Sand and Gravel, Inc.
Burrillville, Rhode Island

Region: I

AA, OSWER
Briefing Date: June 25, 1984

SITE DESCRIPTION

This semi-rural site has been a sand and gravel mining operation owned by Western Sand and Gravel, Inc., since 1953. In 1975 approximately 12 acres of the 20-acre site were used for the disposal of 480,000 gallons of liquid wastes, including chemicals and sewage waste. These wastes were dumped into unlined lagoons and seepage pits. Ground water contamination has occurred at the site and a plume of contamination is moving towards domestic wells adjacent to the site.

SELECTED ALTERNATIVE

The selected cost-effective remedial alternative includes: the installation of a permanent alternate water supply to service approximately 56 parcels of land, and the installation of carbon canister filters as a temporary abatement measure for 8 homes with contaminated wells until the permanent water supply is functional.

ISSUES AND RESOLUTIONS

KEY WORDS

1. The alternate water supply system will provide capacity for fire protection, based on current demand, because of the minimal additional cost.

   - Cost Factors
   - Fire Protection
   - Water Supply System

2. Although the final remedial action will provide for source control measures, the ground water in the vicinity of the site will remain contaminated. The selected remedial measure (alternate water supply) will abate the public health risk associated with the contaminated ground water and the RI/FS indicates that there will not be adverse impacts to ground water receptors. If CERCLA actions are required to be in

   - Alternate Concentration Limit (ACL)
   - Ground Water Contamination
   - RCRA

ISSUES AND RESOLUTIONS

KEY WORDS

conformance with the technical provisions of RCRA, corrective action must be taken to address the remaining contaminated ground water or an Alternate Concentration Limit (ACL) established. The Region submitted a proposal for an ACL at the site. It was determined that there was insufficient data to warrant an ACL at this time.

5. The negotiated eighty percent settlement will be rejected because additional ground water investigation and possible future remedial actions may be required to mitigate the contaminated ground water.

- Enforcement
- Negotiated Settlement

6. Since this ROD did not address all the ground water issues pertaining to site closure, a future ROD will be prepared for Western Sand and Gravel to focus on the cost implications and technical considerations for cleanup of the contaminated ground water. This ROD will also incorporate the Agency's ground water strategy into the recommended alternatives.

- Ground Water Cleanup
- Ground Water Strategy

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RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

Site: Western Sand and Gravel
Burrillville, Rhode Island

DOCUMENTS REVIEWED:

I am basing my decision primarily on the following documents describing the analysis of cost-effectiveness of remedial alternatives for the Western Sand and Gravel Site:

- Remedial Investigation/Feasibility Study for Western Sand and Gravel, Arthur D. Little, Inc., May 22, 1984.
- Remedial Investigation/Feasibility Study for Western Sand and Gravel, Arthur D. Little Inc., January 31, 1984.
- Remedial Investigation/Feasibility Study for Western Sand and Gravel, Arthur D. Little, Inc. October 5, 1983.
- Test Pit Explorations, Goldberg-Zoino and Associates, June 1981.
- Letter from Philip P. Virgadamo of Environmental Resources Associates, Inc. to Christine J. Spadafor, EPA Region I Site Manager, April 9, 1984.
- Staff summaries and recommendations.
- Responsiveness summary dated June 1984.

DESCRIPTION OF SELECTED OPTIONS:

- Installation of water filters as an Initial Remedial Measure to provide protection for homes with contaminants identified in their wells, until the permanent alternate water supply is functional.
- Installation of a permanent alternate water supply to service approximately 56 parcels of land.

DECLARATIONS:

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that the remedial action providing for a permanent water supply at the Western Sand and Gravel site is a cost-effective remedy and provides adequate protection of public health, welfare, and

the environment, with respect to present drinking water contamination. I have also determined that the installation of filters on individual homes as an initial remedial measure is a cost effective remedy and provides adequate protection of public health, welfare, and the environment. The State of Rhode Island has been consulted and agrees with the approved remedy, since it is consistent with the conditions that the State believes are appropriate for this site. In addition, some actions will require future operation and maintenance activities to ensure the continued effectiveness of the remedy. These activities will be considered part of the approved action and eligible for Trust Fund monies for a period not to exceed one year.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies used at other sites. In addition, the agency will authorize the collection of additional contamination and ground water data necessary to characterize the requirements of source control and site closure.

EPA will also undertake an additional study to evaluate alternative ground water corrective actions. If additional remedial actions are determined to be necessary, a Record of Decision will be prepared for approval of the future remedial action.

9/28/84
Date

Lee M. Thomas
Assistant Administrator
Office of Solid Waste & Emergency Response

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
Western Sand and Gravel
Burrillville, Rhode Island

SITE HISTORY AND DESCRIPTION

The Western Sand and Gravel site is located in Burrillville, Rhode Island, adjacent to the Douglas Pike and close to the town line of North Smithfield. Historically, this semi-rural site was a gravel mining operation owned by Western Sand and Gravel, Inc., and operated by Mr. James Cardi since about 1953.

Beginning in about 1975, approximately 12 acres of the 20 acre site were used for the disposal of liquid wastes, including chemicals and sewage waste (see Figure 1). Wastes were dumped into four chemical lagoons and eight or more seepage pits. All lagoons and pits were unlined. The waste pits and lagoons were 80 to 100 feet long, 18 to 20 feet wide and 8 to 10 feet deep. The wastes subsequently infiltrated into the soil, percolating through the highly permeable soils into the groundwater.

There are approximately 56 parcels of land within 1/2 mile of the site affected or potentially affected by the contaminants migrating off-site. The Remedial Investigation/Feasibility Study (RI/FS) determined that ground water has been contaminated by hazardous waste at the site and is moving in a northerly direction to domestic wells adjacent to the site. There are approximately 600 persons that are served by groundwater via private drinking wells within a one mile radius of the site. The contaminated ground water also discharges into both the Tarkiln Brook and the Slatersville Reservoir. The Reservoir is used for recreational purposes and is not a source of drinking water. However, the site does overlie the Slatersville Aquifer, a major ground water aquifer for the State of Rhode Island.

In May of 1975, the Rhode Island Department of Health approved a request by Mr. Cardi to dispose of sewage waste in two trenches at Western Sand and Gravel. These operations continued and were initially monitored by the Rhode Island Division of Solid Waste Management in March 1976. In November 1976, a chemical pit was identified during a site inspection by the Rhode Island Division of Solid Waste Management, and acid wastes were observed being disposed of during a subsequent site visit in January 1977. A fire occurred in one of the chemical pits in March 1977, and officials from the Burrillville and North Smithfield Fire Departments ordered Mr. Cardi to remove the chemicals from the site. Mr. Cardi responded by burying the contents of the chemical lagoon. During the period of April through August 1977, there were a series of State court hearings held related to Mr. Cardi's violations of guidelines for the disposal of septic tank and cesspool wastes. Also, the State received complaints from nearby residents, regarding chemical odors emanating from the Western Sand and Gravel site.

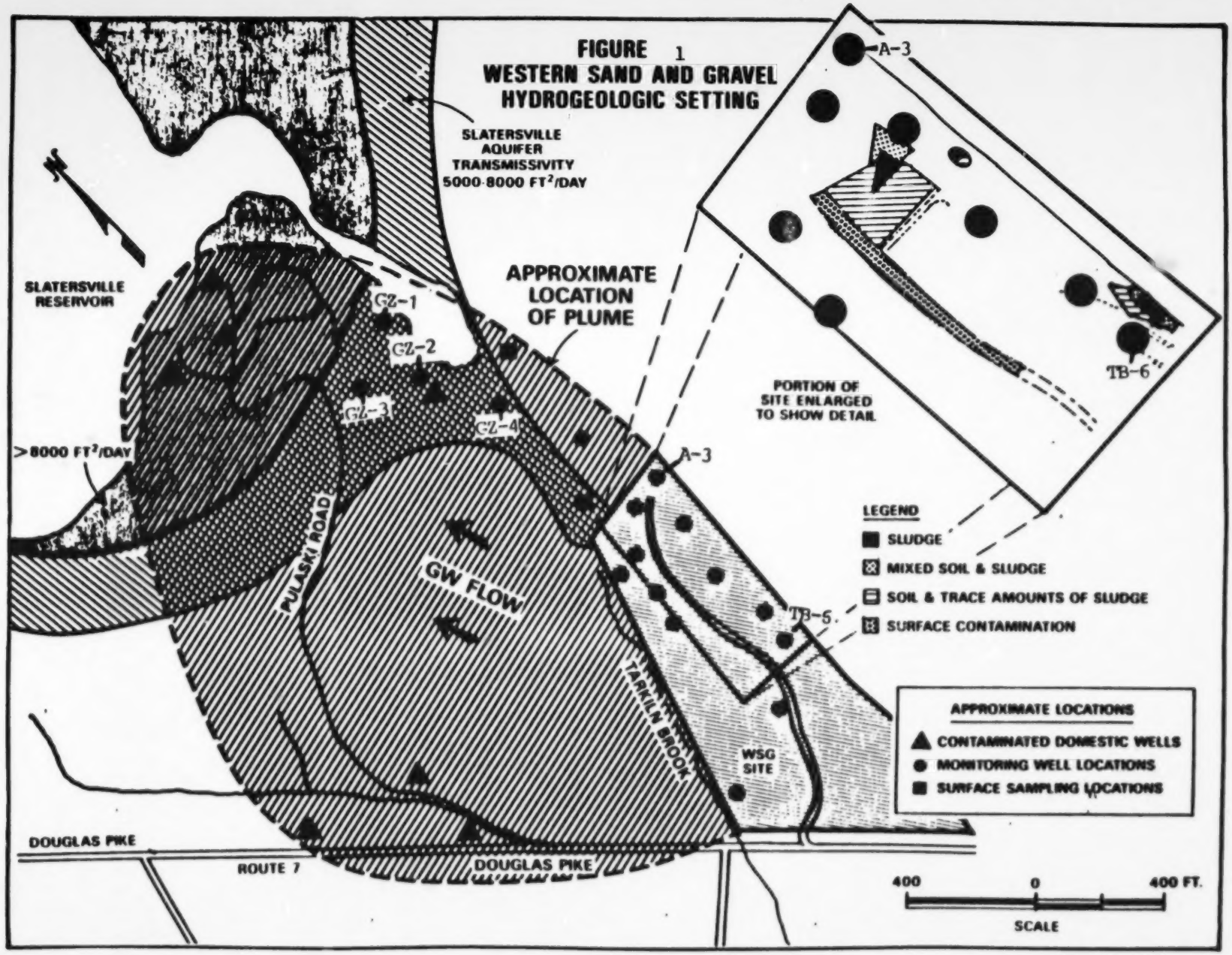
FIGURE 1
WESTERN SAND AND GRAVEL
HYDROGEOLOGIC SETTING
SLATERSVILLE AQUIFER TRANSMISSIVITY 5000-8000 FT²/DAY
SLATERSVILLE RESERVOIR
APPROXIMATE LOCATION OF PLUME
GZ-1
GZ-2
GZ-3
GZ-4
>8000 FT²/DAY
PULASKI ROAD
GW FLOW
TARKILN BROOK
WSG SITE
A-3
TB-6
TB-5
PORTION OF SITE ENLARGED TO SHOW DETAIL
LEGEND
SLUDGE
MIXED SOIL & SLUDGE
SOIL & TRACE AMOUNTS OF SLUDGE
SURFACE CONTAMINATION
APPROXIMATE LOCATIONS
CONTAMINATED DOMESTIC WELLS
MONITORING WELL LOCATIONS
SURFACE SAMPLING LOCATIONS
DOUGLAS PIKE
ROUTE 7
DOUGLAS PIKE
400 0 400 FT.
SCALE

The Rhode Island Department of Environmental Management (DEM) was formed in October 1977 and this agency forwarded emergency industrial waste regulations to Mr. Cardi in December 1977. Mr. Cardi responded to these regulations by notifying DEM in March 1978 that the site was an industrial waste disposal site. There was no further regulatory activity (other than inspections) during the remainder of 1978.

In January 1979, concern of local residents and State officials over the site resulted in a joint meeting of the Burrillville and North Smithfield town councils to discuss the operations at the site. Private domestic wells in the area of the site were sampled by the Rhode Island Department of Health for contamination and in February 1979, a Notice of Violation Order was sent to Mr. Cardi by DEM. A Cease and Desist Order was issued by DEM on April 24, 1979, for among other things, violation of water and air pollution regulations, and odors. Hearings on the Order were held in May and June 1979. Also, the towns of Burrillville and North Smithfield declared that the Slatersville Aquifer had become contaminated by wastes migrating from the site. Six ground water monitoring wells were installed by Western Sand and Gravel under a consent agreement with DEM and tested during November 1979. Analyses of the samples showed the presence of toluene, xylene, chloroform, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene and dichloromethane. In the same time period DEM issued a consent decree, a show cause order on closure, and a final closure order for pumping the chemical wastes from the lagoons.

In 1979, hazardous wastes were no longer accepted at the site. State industrial waste manifests were kept for materials deposited at the site from May 1978 to April 1979. The manifests show approximately 470,000 gallons of waste deposited at the site during that one year period. The quantity of wastes deposited at the site prior to May 1978 is unknown.

In March 1980, personnel from the EPA Environmental Services Division, on request from DEM, pumped the lagoons and began removal of the hazardous material. It is estimated that approximately 60,000 gallons of liquid materials were removed. These actions were taken under the authority of Section 311 of the Federal Water Pollution Control Act, as amended.

In December of 1983, the ground water recirculation system installed by the State of Rhode Island in November 1982, with the intent of controlling the migration of hazardous wastes from the site, malfunctioned, causing an overflow of between 50 and 250 gallons of waste material from an underground 10,000 gallon capacity tank. The Rhode Island Department of Environmental Management immediately took action to clean up the spill and disposed of the contaminated spill debris at its expense. DEM then notified the EPA Environmental Services Division and requested that the Agency assess the situation. As part of the EPA assessment,

samples of aqueous and non-aqueous materials from the underground tank were sampled. In addition, the Department of Environmental Management excavated and removed from the site twelve drums of soil that were contaminated because of the overflow and replaced one of the system's pumping wells.

CURRENT STATUS

A. Quantity, Types and Concentrations of Hazardous Substances

The RI/FS for the Western Sand and Gravel site was conducted by Arthur D. Little, Inc. The exact quantity and types of waste deposited at the site are unknown. In addition, it is not certain when hazardous wastes were first deposited there. Therefore, it is not possible to determine the maximum possible amounts of wastes dumped at the site. However, based on information provided by the Rhode Island Department of Environmental Management manifests, approximately 470,000 gallons of wastes were disposed of at the site during 1978-1979, with a monthly average of 36,000 gallons.

YEAR	MONTH	GALLONS
1978	May	10,000
	June	22,700
	July	5,300
	August	40,600
	September	52,500
	October	28,100
	November	23,100
	December	32,750
1979	January	51,400
	February	58,300
	March	63,800
	April	79,000
	TOTAL	467,750

A priority pollutant analysis of hazardous wastes in the lagoons provided the following information on the types and concentrations of the substances present (results in ug/l or ppb). Prior to the pumping out of the lagoons, they were sampled at the surface and the bottom (sediments). Leachate run-off from the lagoons was also sampled.

Volatiles	Surface (ug/l)	Sediments (ug/l)	Leachate (ug/l)
Methylene chloride	19,000	23,000	30
1,1-Dichloroethylene	340	-	-
Trichlorofluoromethane	730	-	-
1,2-Dichloroethane	1,200	-	-
1,1,1-Trichloroethane	230,000	460,000	66
1,1-Dichloroethane	4,700	7,500	24
Trichloroethylene	140,000	550,000	3

Volatiles (Cont.)	Surface	Sediments	Leachate
Benzene	69	970	17
1,1,2,2-Tetrachloroethylene	280,000	91,000	2
Toluene	24,000	7,200	230
Ethylbenzene	68,000	23,000	13
Chlorobenzene	-	-	2.8
Acids			
o-Chlorophenol	540	-	-
Phenol	980	-	-
4-Chloro-m-cresol	1,000	160	-
4,6-Dinitro-o-cresol	940	-	-
Base Neutrals			
Naphthalene	7,800	2,900	-
Anthracene	1,600	360	-
Pyrene	440	110	-
Fluoranthene	210	230	-
Chrysene	490	170	-
Butyl benzylphthalate	47,000	14,000	24
Detection Limits	10	42	0.2

B. Extent of Contamination

There are three primary sources of contamination at the Western Sand and Gravel site. These include the contaminated ground water plume located primarily in the northwest quadrant of the site but extending in a northerly direction toward the Slatersville Reservoir, chemical sludges found in the unsaturated zone at several locations on the site, and non-aqueous phase liquids (not soluble in water) that are primarily in the area near the existing ground water recirculation system. It is estimated that 3,818 cubic yards of sludge and sludge contaminated soils remain on site, as well as 582 cubic yards of contaminated surface material (contained within the surface areas to a depth of 6 inches) 1573 cubic yards of contaminated soil below the sludge in the unsaturated zone (these soils are contaminated by the overlying sludge and less viscous materials), and approximately 17,000 cubic yards of contaminated soils located in and around the waste handling areas. These numbers were calculated as follows (quantities were derived from the RI/FS unless otherwise noted and include a 30% contingency):

Sludge & Sludge Contaminated Soil

LOCATION	VOLUME (yd^3)
Pit 11 (Area A in RI/FS)	145
Pit 2 (Area B in RI/FS)	30
Area C in RI/FS	233 (RI/FS)
plus additional GZA calculations	2210 (GZA)
Area E in RI/FS	1200
TOTAL	3818

The RI/FS estimated a total of 1600 yd^3 of contaminated sludges. The Goldberg-Zoino (GZA) report estimates between 2000 and 4000 yd^3 total contaminated sludges. The GZA report appears to be more accurate in its calculations for the amount of sludge on site, as the GZA investigation done in support of the report included numerous test pit explorations in an area not able to be investigated by the RI/FS contractor due to placement of the ground water recirculation system. Based on the GZA report as a supplement to the RI/FS, the amount of sludge remaining on-site is calculated to be 3820 yd^3, which includes a 30% contingency for sludge-contaminated material located next to the sludges (hereafter referred to as the visibly contaminated soils).

SURFACE MATERIAL

LOCATION	VOLUME (yd^3)
Pit 11	160
Pit 2	22
Area F in RI/FS	400
TOTAL	582

CONTAMINATED SOIL TO SATURATED ZONE

LOCATION	VOLUME (yd^3)
Pit 11	350
Pit 2	48
Area C in RI/FS	1175
TOTAL	1573

CONTAMINATED WASTE HANDLING AREAS

LOCATION	VOLUME (yd^3)
Area D in RI/FS	1,070
Area G in RI/FS	17,000
TOTAL	18,070

The contaminated ground water plume is migrating in a northerly direction and has intersected monitoring wells at depths ranging from 45 to 75 feet below ground level.

C. Pathways of Migration

The contaminants leaving the Western Sand and Gravel site are migrating primarily via ground water and surface water. Contaminants are entering drinking water wells, the Tarkiln Brook and the Slatersville Reservoir.

The ground water flow in the area of the Western Sand and Gravel site occurs principally in the unconsolidated deposits and in fractured portions of bedrock. Measured depth to ground water ranges from approximately 4 feet to 30 feet. The thickness of unconsolidated material is variable beneath the disposal site and generally parallel to the Tarkiln Brook. The lower portion of unconsolidated deposits is slightly more permeable than the upper portion.

The contaminated ground water flow at Western Sand and Gravel discharges to the Slatersville Reservoir and Slatersville Aquifer. The hydrogeologic conditions downgradient from the site are such that this flow is partitioned with approximately 80% discharging directly to the Reservoir and 20% recharging the Slatersville Aquifer that ultimately discharges to the Reservoir (partitioning based on an evaluation of the horizontal and vertical hydraulic gradients in areas adjacent to the Reservoir). The contaminant loading to the Reservoir is approximately 3 gallons per day of volatile organics, assuming a ground water flow of 9000 gallons/day with a worst case volatile organic content of 410 ppm, based on monitoring well observations. Based on modeling, the dilution capacity of the Reservoir in the area of the contaminated discharge was estimated at 30 million gallons, yielding an effective concentration of 0.10 ppm of total volatile organics. The concentration of specific chemicals would be appreciably lower. Approximately 0.7 gallons per day of volatile organics would flow to the Aquifer, which in turn discharges to the Reservoir.

Estimates of hydraulic properties of the stratified drift on site include hydraulic conductivity that ranges from 12 to 90 feet per day and porosity that ranges from 0.20 to 0.35. These in combination with hydraulic gradient estimates of 0.002 to 0.003 yields a transport velocity range of 0.2 to 1.5 feet per day.

Test drilling results indicate that the upper portion of the bedrock is fractured and is a path for ground water flow. The estimated hydraulic conductivity is one foot per day and porosity is 0.01 (1%) for the fractured bedrock.

D. Actual or Potential Affected Receptors

There are both human and environmental receptors that are currently or potentially exposed to contaminants migrating from the Western Sand and Gravel site. The primary receptors are the individual residents downgradient from the site whose drinking water wells have already or may potentially become contaminated with hazardous chemicals. Currently, nine homes have shown contamination of private drinking water wells at least one time during their sampling history. The highest levels detected in the private wells are within the National Interim Primary Drinking Water Standards for noncarcinogens. However, the levels are in excess of a 10^{-6} excess cancer risk. The levels detected and the associated risk are as follows:

Contaminant	Level	10^{-6} Excess Cancer Risk
1,1,1 - trichloroethane	6 ppb	being investigated by EPA Cancer Assessment Group for carcinogenic properties
trichloroethylene	5 ppb	2.8 ppb
tetrachloroethylene	8 ppb	0.9 ppb
1,2 - dichloroethane	21 ppb	0.95 ppb
1,1 - dichloroethane	2 ppb	carcinogenic properties suggested in animal studies
dichloromethane	18 ppb	0.19 ppb - cancer risk based on chloroform, a suspected carcinogen

In addition, based on the extent and directional flow of the plume and monitoring observations, it is expected that more private wells will exhibit contamination in the future, although (because of the nature of the subsurface conditions,i.e. a ground water flow gradient down into fractured bedrock) it is difficult to predict precisely which of the existing and potential future wells in the threatened area will actually become contaminated. It is also difficult to predict how long a given well is likely to remain contaminated. While the ingestion of contaminated drinking water poses a current and future public health risk, the current and projected use of the Reservoir indicates there is no acute or chronic public health risk associated with exposure to surface water in the Reservoir.

In the vicinity upgradient from the majority of residential wells, yet within the contaminated ground water plume, is ground water monitoring well GZ-1. Because of the location of GZ-1, it provides information on the horizontal and vertical extent of contamination and was used as an indicator well for possible future impacts on the residential wells.

Contaminant	Level (ppb) GZ1-2*	GZ1-3**	10^{-6} Excess Cancer Risk (ppb)	Draft SNARL (ppb)
1,1-dichloroethylene	10	14		7
1,1-dichloroethane	184	226	carcinogneic properties suggested in animal studies	
trans-1,2-dichloroethylene	398	202		275***

1,2-dichloroethane	2	-	0.95	
1,1,1-trichloroethane	12	66	being investigated for carcinogenic properties	1000(HA)
chlorobenzene	23	64		20(°)
benzene	10	38	0.68	
toluene	87	440		340
ethylbenzene	32	190		
xylene	120	720		620
chloroethane		2		

*GZ1-2 is 45 feet below surface
**GZ1-3 is 74 feet below surface
***10-day EPA Draft Suggested No Adverse Response Levels (SNARLS)
(HA) Health Advisory
(°) based on organoleptic properties, EPA Ambient Water Quality Criteria

Recent monitoring results from this well indicate an increase in the concentration of hazardous substances in the contaminant plume. It is believed that this increase will begin to be reflected as increased contaminant levels in residential wells.

Based on the available residential and ground water well data coupled with the determined location and migration of the contaminated ground water plume, a threat to public health is determined to exist, as evidenced by contaminant levels above the 10^{-6} excess cancer risk. In addition, in the absence of established formal drinking water standards or maximum contaminant limits for the substances cited in the table immediately above, EPA believes that the draft SNARL's (prepared by EPA's Office of Drinking Water for advisory purposes), although not enforceable regulations, provide a reasonable indication that the levels of certain contaminants found in well GZ-1 may be of concern. Even with complete removal of the contaminant source, it would take at least 15 years and probably longer for contaminant levels at GZ-1 to decrease to safe levels.

Direct contact is another route of exposure of concern at this site. The site has been used for dirt biking and for pet runs, as well as being in close proximity to the sand and gravel operations located on the property.

Other receptors include the biological flora and fauna found in the Tarkiln Brook and Slatersville Reservoir including pickerel, blue-gill, and bass living in the Reservoir. However, the quantities of substances released to the Tarkiln Brook are estimated to be

below those associated with aquatic toxicity. In addition, small game including rabbits and squirrels have been observed in the area and may be exposed to the contaminated waters of Tarkiln Brook. The remedial investigation indicated that these species are not being impacted by the contaminated surface flow. The U.S. Department of the Interior (DOI) stated in its preliminary natural resources evaluation of the site that no lands, minerals, waters or Indian resources under DOI's trusteeship have been damaged by releases of hazardous substances and that the current existing risk to DOI trust resources is relatively low. Monitoring data from April 1984 indicate that concentrations of hazardous substances within the Tarkiln Brook decrease with distance downstream, owing in part to dilution effects.

The five surface water samples collected (one up-stream from the site, two adjacent to the site, one in the swamp and one at the confluence where the Tarklin Brook and Reservoir meet) represent the most recent surface water monitoring data. All samples measured at non-detectable levels except for one sample taken adjacent to the site. According to the RI/FS, the levels detected in that sample do not pose an acute toxic hazard to aquatic and terrestrial species.

The levels of contamination projected in Tarkiln Brook and the Slatersville Reservoir do not pose an acute toxic hazard to aquatic and terrestrial species. Also, the concentrations of contaminants discharging to the Slatersville Aquifer are below any levels associated with immediate risk to flora and fauna.

ENFORCEMENT

On February 7, 1984, a meeting attended by 49 of the 91 potentially responsible parties (PRPs) was held in Boston, MA, to begin negotiations in order to determine whether any responsible party was willing and able to undertake remedial design and construction. Negotiating meetings were conducted with the steering committee representing approximately 45 PRPs on March 20; April 11; May 3; May 16 and May 30, 1984. On April 4, 1984, EPA met with a technical representative of the steering committee to discuss comments on the RI/FS. EPA does know that 17 of the 20 largest contributors (by volume) are represented by the steering committee. A negotiation schedule was developed requiring the parties to commit by May 30, 1984, their willingness to undertake the remedy. On May 30, 1984, the PRPs made an offer and EPA responded with a counter-offer requiring implementation of the remedy outlined in this document and repayment of most post-CERCLA expenditures. In light of the imminence of settlement and delay in the ROD briefing from June 14 to June 25, EPA extended its negotiation deadline until June 15, 1984. On June 22, 1984, the PRP's offered the agency a cash settlement of approximately $2.23 million, representing 80% of the Agency's costs. This offer was rejected because a cash-out settlement posed unacceptable

financial risks, because the proposed settlement would leave 20% of EPA's costs unreimbursed with few viable PRP's remaining to pursue.

ALTERNATIVES EVALUATION

Based on the findings of the remedial investigation and risk assessment, the following response objectives were identified:

1) To provide residents in the affected area with a permanent supply of safe drinking water;

2) Abate local sources of contamination at the site;

3) Minimize future public health risks by restricting site access.

There were twelve alternatives considered in attempting to meet the above objectives. These remedial alternatives were developed by combining off-site components for a permanent water supply and on-site components for contaminant source reduction and site closure. The twelve alternatives include:

1. No action.

2. Off-site water supply only.

3. Permanent relocation only.

4. Off-site water supply, limited capping, fencing, grading, seeding, loaming and monitoring.

5. Off-site water supply, full capping, fencing, grading, seeding, loaming and monitoring.

6. Off-site water supply, on-site landfarming, encapsulation, and/or landfilling of sludges and visibly contaminated soil, fencing, grading, seeding, loaming and monitoring.

7. Off-site water supply, limited excavation and off-site disposal of sludges and visibly contaminated soil, fencing, grading, seeding, loaming and monitoring.

8. Off-site water supply, Area E excavation and off-site disposal, fencing, grading, seeding, loaming and monitoring.

9. Off-site water supply, limited excavation and off-site disposal of sludges and visibly contaminated soil including Area E, fencing, grading, seeding, loaming and monitoring.

10. Off-site water supply, total site excavation and off-site disposal of sludges and visibly contaminated soil, fencing, grading, seeding, loaming and monitoring.

11. Off-site water supply, limited capping and limited excavation and off-site disposal of sludges and visibly contaminated soil, fencing, grading, seeding, loaming and monitoring.

12. Off-site water supply, limited capping and limited Area E excavation and off-site disposal of sludges and visibly contaminated soil, fencing, grading, seeding, loaming and monitoring.

In accordance with Section 300.68(g) of the National Contingency Plan (NCP), these alternatives were developed considering both source control and off-site remedial actions. The alternatives were based on the results provided in the remedial investigation which determined that contaminants are migrating off-site via ground water and have already impacted nine drinking water wells. (The RI/FS determined that seven residences in the affected area have shown contamination in their drinking water. Discussions between the EPA Regional Site Manager and the Rhode Island Department of Health, after the RI/FS was completed, confirm that as of May 1984, nine homes within the affected area have shown contamination in their private drinking wells.)

The initial listing of the twelve remedial systems can best be classified by evaluating the components of each system according to on-site and off-site remedies.

Off-site components investigated include:

A. No action.
B. Permanent relocation of residents.
C. Permanent drinking water treatment (carbon filters, bottled water).
D. Permanent alternate water supply.
E. Treatment of the contaminated water using the existing groundwater recirculation system.

On-site components investigated include:

A. Contaminant Source Reduction/Control

1. No action
2. Capping
3. Landfarm/encapsulation
4. Excavation and off-site disposal
   a. Limited
   b. Total site
5. Existing groundwater recirculation system

6. On-site Landfill (in compliance with RCRA)
   a. Limited
   b. Total site

B. Site Closure

1. No action
2. Fencing
3. Grading, loaming and seeding
4. Monitoring
5. Capping

The components of the twelve remedial systems were screened according to the requirements of Section 300.68(h) of the NCP in order to narrow the list of potential remedial actions for further detailed analysis. The criteria used in the initial screening process included: 1) total system costs, considering net present value of capital and O and M costs; 2) effects of the alternative upon the environment with evaluation of whether the alternative will achieve source control and mitigate threats to public health, welfare and the environment; and 3) acceptable engineering practices with respect to feasibility and reliability for addressing the problem.

The initial screening of the off and on-site remedies resulted in excluding the off-site option of no action. Considering the criteria (i.e. mitigation of the threat to public health) for effects of the alternative, this option was screened out based on the fact that certain wells are now contaminated at levels of concern, and that there is a reasonable expectation that contamination will appear in additional wells located between the site and the reservoir. A representative sample of contaminants identified in private drinking water wells at "levels of concern" includes: 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1-dichloroethane and dichloromethane. Based on sampling from upgradient wells these levels are likely to increase.

The reason for consideration of permanent relocation of residents located within the affected area is based solely on public health concerns related to the present and potential ingestion of contaminated drinking water from the private wells. The cost of purchasing the 56 parcels of land, which now show or may in the future show ground water contamination, at fair market value is $3,310,000. The public health problem of ingesting contaminated water can be more cost-effectively abated by installing an uncontaminated alternate water supply for $1,200,000. The cost of relocation was evaluated against only the cost of the installation of an alternate water supply because the public health concern was based solely on the ingestion of contaminated drinking water from the private wells. Therefore, the off-site option for permanent relocation of residents in the affected area for public health considerations can be eliminated on the basis of cost.

Treatment of the contaminated ground water off-site using the existing ground water recirculation system was omitted as an option based on the determination that the system will not mitigate the threat to public health caused from ingestion of the contaminated ground water. A portion of the plume has already migrated off-site, contaminating nine private drinking water wells. While such a system may help retard contaminant migration from the site, the existing system would not pull back the contaminated groundwater already downgradient from the site or restore the contaminated wells. Without such restoration, current and future threats to public health from ingestion of contaminated drinking water would not be mitigated.

Several on-site remedies for contaminant source reduction/control were also excluded from further consideration during the initial screen. The no action alternative was excluded using the criteria for effects of the alternative, based on the fact that no action would not achieve source control. Based on the results of the remedial investigation and risk assessment, a continuing source of contamination would provide a threat to public health from potential dermal exposure. In addition, in reviewing site conditions to develop a natural resources survey, the U. S. Department of the Interior has determined that in the absence of remedial action, there is a definite potential for future damages. The continuing source of contamination would result in adverse environmental effects, in that the sludges left on-site could cause degradation in surface and ground waters and lengthen the time necessary for the Slatersville Aquifer to cleanse itself.

The landfarming/encapsulation options were excluded from consideration because the technologies are considered to be unproven with respect to treating the types of wastes found in the soils at Western Sand and Gravel and, therefore, did not meet the criteria for acceptable engineering practices.

The existing groundwater recirculation system was excluded from consideration as a long-term on-site option for contaminant source reduction/control based on effects of the alternative. As previously stated, regarding its impact on public health, operation of such a system would not improve the water quality in already-contaminated private drinking water wells. The system has proven somewhat effective in capturing non-aqueous phase liquids floating on the groundwater surface.

The RI/FS predicted that removal of the recirculation system could permit any remaining non-aqueous phase liquids to migrate in a northerly direction until intercepted by the Tarkiln Brook. Should this occur, projections indicate that there would be no adverse acute toxic effects on aquatic and terrestrial life from the nonaqueous material, as it is suspected that most of the non-aqueous layer has already been removed from the groundwater surface

and stored in an underground tank. This estimation that most of the non-aqueous phase liquids have already been removed is based on observations that the system has been capturing non-aqueous phase liquids at a rate much below that experienced during 1982 and 1983.

The on-site alternative of no-action for Site Closure was also rejected, because closure provisions are necessary to adequately protect public health and the environment from future migration from this site.

Consistent with Section 300.68(i) of the NCP, the off-site and on-site remedies remaining after the initial screening were included in a detailed evaluation. The detailed analysis of each option included:

1. Description of appropriate treatment and disposal technology.
2. Special engineering considerations (pilot plant, additional studies).
3. Environmental impacts of proposed methods.
4. Operating, maintenance and monitoring requirements.
5. Off-site disposal needs and transportation plans.
6. Temporary storage requirements.
7. Safety requirements for remedial implementation on-site and off-site.
8. Description of how the alternative could be phased into operable units.
9. Description of how the alternative could be segmented into areas to allow implementation of differing phases of the alternative.
10. A review of the off-site facilities provided by the state to ensure present and future compliance with RCRA.
11. Environmental risk assessment.
12. Cost analysis - total costs including operating and maintenance.
13. Reliability of the system.
14. Implementability at the site.

The remedial components considered after the initial screening are listed below:

Off-site

°Permanent limited water supply system (bottled water).

°Permanent alternate water supply.

°Permanent drinking water treatment for total home use (filters).

°Temporary drinking water treatment for total home use (filters) until the permanent supply is functional.

°Temporary alternate water supply (bottled water) until the permananent supply is functional.

On-site

°Removal of existing recirculation system.

°Soil and sludge excavation and on-site RCRA Landfill.
a. Limited (3,820 yds^3)
b. Total (24,000 yds^3)

°Soil and sludge excavation and off-site disposal at A RCRA facility.
a. Limited (3,820 yds^3)
b. Total (24,000 yds^3)

°Capping.
a. Limited
b. Total (400,000 ft^2)

°Site Closure.
- Capping
- Fencing
- Grading, Loaming, Seeding

°Ground water monitoring consistent with RCRA requirements.

In the course of the assessment of on-site alternatives, EPA determined that existing sampling data on the location of the sludges, concentrations of contaminated material below the sludges, and the extent to which those areas were subject to ground water saturation on a seasonal basis were insufficient to permit final selection of a remedy. Therefore, the decision for on-site remedies is being deferred pending the development of additional contamination and ground water data. The remainder of this ROD addresses off-site actions only.

RECOMMENDED ALTERNATIVE

The recommended off-site alternatives for the Western Sand and Gravel Site were selected in accordance with the NCP. particularly Section 300.68(j), and was determined to be the most cost-effective alternative that adequately protects and mitigates damage to public health, welfare and the environment.

A. OFF-SITE ALTERNATIVES

In considering the off-site options for a potable water supply, the alternative of a permanent alternate water supply was determined to be the most cost-effective long-term remedy. The areas to be provided with an alternative water supply have been determined as follows. First, water would be provided to nine parcels where wells have demonstrated contamination to date. Second, there are 47 other parcels of land located between the source of contamination and the reservior, and in the general area where contaminated wells have been found. It is expected that at least some of these wells will show contamination in the future, and that contamination would continue for some time. It is impossible, however, to reliably identify which particular wells will be contaminated. If EPA did not provide alternate water for these parcels at this time, it would be necessary to sample the wells periodically and if contamination were found in the future, to consider extending alternative water supplies at that time. Although EPA has not specifically analyzed the costs of long-term monitoring of the potentially affected area and extending alternative water on a piecemeal basis, it is believed that it would be more efficient to provide alternative water to the entire potentially affected area at one time. In addition, extending water now would reduce the risk that persons may be exposed to contamination before periodic sampling could detect this contamination. The estimated present worth cost for providing a safe drinking water supply through an alternate system is $1,200,000. The estimated cost for individual carbon canisters (total home use) is $156,800 for 56 units for the first year, including capital and O & M. Yearly O & M after the first year is $100,800. Therefore, in 11 years, the cost of filtration units would be approximately the same as the cost of a permanent alternate water supply. Starting the 12th year of filtration use, that system would become increasingly more expensive than the other permanent alternate water system. The same cost argument is true for bottled water, estimated to cost $95,200 per year to supply 56 parcels. In 12 to 13 years, the cost of using bottled water for drinking purposes only and not total home use would exceed the cost of the permanent alternate water supply. Therefore, an alternate water supply providing uncontaminated potable water for total home use to 56 parcels is the most cost-effective long-term solution.

The installation of an alternate water system has been determined to be the most cost-effective long-term method to abate the current and potential public health risks associated with ground water contamination. The cost of the system provides for water to the tap for all home uses for 56 parcels and for fire protection. Fire protection capacity was calculated as comprising 4.2% or approximately $50,000 of the total cost of the alternate water system. Because the cost of fire protection is such a small percentage of the cost of the total system and would offset some of the maintenance required system costs (i.e. flushing valves), it is recommended that it be a component of the alternate water system.

Once it was determined that an alternate water system was the most cost-effective option for the provision of potable water, locations and availability for the alternate supply were explored:

EVALUATION OF ALTERNATE WATER SUPPLY LOCATIONS

SYSTEM	EVALUATION
1. Slatersville	-inadequate capacity as sole source
2. Industrial	-inadequate capacity as sole source; currently used for industrial purposes and one of the two wells is high in iron
3. Nasonville	-inadequate capacity as sole source
4. Slatersville/Industrial Tie-In	-adequate capacity but local institutional constraints make it unavailable
5. Well Field A	-adequate yield and upgradient from the site; close to the affected area
6. Well Field B	-close to the affected area with adequate yield, but may possibly have future contamination from the WSG site
7. Well Field C	-close to the affected area with adequate yield, upgradient from WSG but downgradient from Landfill and Resource Recovery, a nearby NPL site, so there is a potential for future contamination

8. Area by Tarkiln Pond -close to the affected area with adequate yield and upgradient from WSG; recommended by local citizens involved with local water systems

Water Systems 1, 2, and 3 were eliminated as alternative water supplies because of inadequate capacity. Water Systems 4 through 8 have adequate capacity. System 4 is unavailable because of institutional constraints. Systems 6 and 7 could potentially be impacted by contamination, and would require additional investigation before they could be utilized.

Water systems 5 and 8 are acceptable because 1) both have adequate capacity; 2) both are located within the town of Burrillville and therefore eliminates the politial constraints encountered with water sources located outside of the town and 3) the Town Council of Burrillville has a mechanism for land acquistion, if necessary, to obtain land for a wellfield.

The costs for water systems 5 through 8 are approximately equal. The only difference between the systems is the location of the production wells. The final selection of the well location will be based on technical criteria developed during design.

As previously stated, the contaminant levels in the domestic drinking water wells do not exceed the recommended levels for non-carcinogens prescribed by EPA. However, some of the chemicals detected in these wells are suspect carcinogens. The measured levels and associated 10^{-6} excess cancer risk are as follows:

CONTAMINANT	HIGHEST LEVELS OF SUSPECT CARCINOGENS DETECTED IN PRIVATE WELLS	10^{-6} EXCESS CANCER RISK
trichloroethylene	6 ppb	2.8 ppb
tetrachloroethylene	8 ppb	0.9 ppb
1,2-dichloroethane	21 ppb	0.95 ppb

It is reasonable to assume that these low-levels of carcinogens have been ingested for some time and adverse health effects from such long-term low-level exposure is unknown. In addition, it is appropriate to take preventive public health measures when an excess cancer risk greater than 10^{-6} is determined. Therefore, it is a prudent preventive public health measure to provide temporary clean potable water to those residences exhibiting contamination.

While carbon canister filters and bottled water were determined not to be the most cost-effective options for long-term potable water, it is recommended that filters be used as the initial remedial measure for those homes with contaminated wells, until the permanent water supply is functional. In the event that monitoring results show contamination above an acceptable level for additional residences in the affected area, filters will be provided.

The costs associated with providing carbon canisters for total home water use (bathing, drinking, etc.) for nine homes (including operation and maintenance) for one year is $31,500/yr. The cost for providing bottled water for drinking purposes only and not total home use is $13,600/yr. for 9 homes. Due to the wide range of chemicals present in the plume, it is not certain that ingestion is the only possible route of exposure. To protect against the possibilities of inhalation and dermal exposure, it is recommended that protection for the total home use of water be provided. Therefore, it is recommended that the homes with contaminated drinking water wells be provided with carbon canister filters as an initial remedial measure until the permanent water supply is functional.

The recommended alternative includes:

Remedial System	Present Worth
1. Permanent water supply to 56 Parcels	$1,200,000
2. Temporary water supply (filters) for 9 homes until permanent water supply is functional (2 yrs)	51,750
SUBTOTAL	$1,251,750
15% CONTINGENCY	187,763
TOTAL COST	$1,439,513

COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS

The permanent alternative water supply and the temporary filters will assure that persons in the area potentially affected by contaminated ground water will be provided with water which meets the standards of the Safe Drinking Water Act.

GROUND WATER PROTECTION

The RI/FS indicates that even with source control measures such as capping and soil removal, which will be addressed in a subsequent ROD, ground water in the vicinity of the site would remain contaminated for some time in the future.

The recommended remedy will abate the most immediate and significant public health risk from contaminated ground water. In addition, however, the Agency will also consider the need for either corrective action to address the remaining contaminated ground water. The Agency currently lacks sufficient data to determine the proper course of action for the ground water at this site. A final decision on the necessity and feasibility of ground water treatment at this site will be made upon the completion of additional study. The need for further soil excavation will also be evaluated as part of the cost-effective analysis of ground water treatment.

SCHEDULE

ACTIVITY	DATE
- Approve Remedial Action (ROD)	September 1984
- U.S. Army Corps of Engineers begins selection and procurement process for engineering design services	September 1984
- Award Superfund state contract and issue IAG for design and construction	September 1984
- Amend cooperative agreement	September 1984
- Award design contract, start design	December 1984
- Complete design of Permanent water supply	September 1985
- Start construction of Permanent water supply	November 1985
- Complete construction of Permanent water supply	August 1986

COMMUNITY RELATIONS

EPA released a draft feasibility study (FS) to the public the week of January 30, 1984. Press releases, paid newspaper advertisements, and direct mailings to about 90 persons were used to announce the availability of the document, the comment period, and two public meetings.

EPA held a public meeting on February 2, 1984, to explain the recommendations of the FS, and another meeting, on February 23, to accept community comments on the FS. Both meetings were held in the local community. EPA, the State, and State's consultant, media representatives, citizens, local officials, and Congressionals attended. Between 50 to 100 people were present at each meeting.

The written comment period was initially announced to run from February 2 until February 23, and later extended by EPA to February 29. Citizens then requested the comment period be extended to March 15. EPA compromised and extended it until March 7. Several comments were received shortly after the last deadline. They have been included in this summary.

The majority of the comments came from the Western Sand and Gravel Coordinating Committee, and advisory committee formed in 1981 by the Burrillville Town Council, at the request of the Rhode Island Department of Environmental Management (DEM), to facilitate communication between DEM and local government and to review plans and provide advice to DEM.

The Committee's recommendations were endorsed by the North Smithfield and Burrillville Town Councils, the North Smithfield Conservation Commission, the Burrillville Health officer, State Senator Elizabeth M. Cesario, and two individuals.

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COMMUNITY RELATIONS RESPONSIVENESS SUMMARY

Western Sand and Gravel Superfund Site

Introduction

The responsiveness summary will describe citizen concerns raised during the coment period on the feasibility study and how EPA considered and responded to these concerns.

In addition to the public meetings, EPA and DEM met informally with the Western Sand and Gravel Coordinating Committee twice during the comment period to answer questions about the proposed remedial action and to hear the committee's concerns.

DEM commented on the FS at the February 23 public meeting. Those comments, which recommend modifications of the remedial action recommended by the FS, are listed separately.

Comments from the generators' committee (the Western Sand and Gravel Steering Committee) have also been listed.

COMMUNITY COMMENTS	EPA RESPONSE
° Removal of contaminated soil suggestions ranged from 16,000 cubic yards to "remove all toxic waste." Western Sand and Gravel Coordinating Committee (WSGCC) recommended removing "20,833 cubic yards or all sludge and contaminated soil." Also want excavated areas filled with clean fill.	° After further evaluation of the amount of contaminated soils and sludges remaining on site, the Agency recommends the deferral of on-site remedies pending the development of additional ground water and contamination data, To determine more precisely what contaminants needs to be removed, and what can safely be contained on-site.
° Need for public water supply: WSGCC and several others emphatically supported this FS recommendation, with stipulation of free tie-ins and fees only for usage.	° EPA agrees that a permanent alternate water supply should be provided to residences located in the affected area.
° Ground water recirculation system: want system continued as long as non-aqueous liquids remain, skimming of non-aqueous liquids, and additional pumping wells near areas A and B, and between areas C,D, and E and the brook (recommendations of WSGCC and an individual). Another comment recommended expansion of the system to "remove the 'source ' of the plume."	° Data indicates that the ground water recirculation system has not been effective in stopping migration of contaminated ground water from the site and its usefulness in capturing the non-aqueous liquids appears to be declining. Therefore, EPA does not support long term operation or expansion of the system. Rather, the Agency expects that the system will be shut down and removed in coordination with the source control actions to be selected in a subsequent ROD.

° Location of water supply source: Several commenters sugest specific water supply sources. WSGCC recommended establishing a new domestic well upgradient of the site, and criticized the recommendation to use Slatersville Water System as source; they believe the Slatersville Reservoir has insufficient capacity, and may be subject to contamination from the site and industrial or domestic waste entering Branch River.

° Based on widespread citizen concern regarding the location of the supply source, EPA reevaluated the recommended source, the Slatersville - Industrial Tie-in, as provided in the RI/FS. Further in-depth discussions with hydrologists, regarding locations recommended by the citizens, have resulted in the Agency recommending the location of the water supply be within the Town of Burrillville and in the vicinity south of the site.

° Monitoring: WSGCC recommends 25 years or until steady decline for five years: include surface water from Tarklin Brook, swamp near Slatersville Reservoir, the Reservoir itself, test wells and private wells. Supported by two individuals.

° EPA agrees that a monitoring program, including ground water and surface water sampling, should be conducted. Private wells are also to be sampled according to a monitoring plan. The Agency is considering a monitoring program to be conducted for a period of 30 years in accordance with RCRA Part 264, with provisions for reevaluation in five years after site closure.

° Ground water treatment: WSGCC endorses ground water treatment and suggests a facility DEM had proposeed in 1981. Supported by three commenters.

° The installation of a permanent alternate water supply will abate the current and future public health problems associates with ingestion of contaminated drinking water. However, in order to ensure adequate long term protection of public health & the environment, EPA will further evaluate the need for additional remedial actions. Therefore, an additional study will be conducted to further explore the technological feasibility of ground water treatment.

° Fencing: if additional soil is excavate, WSGCC believes fencing will be necessary only around the recirculation system.

° The Agency expects that the final source control alternatives will include placing a fence around the area where the pits and lagoons were located (9.25 acres) in order to restrict site access and subsequent further use of the area. Restricting site access also serves as a preventive public health measure in protecting persons from dermal contact with any remaining contaminated soils.

° Warning signs: WSGCC and another commenter supported this FS recommendation of placards around site perimeter.

° The Agency agrees that placards should be placed around the perimeter of the site, as well as at the brook, swamp and mouth of the reservoir.

° Property buy-out: requested by two individuals.

° The Agency believes that providing a potable source of uncontaminated water is the cost-effective measure for mitigating the public health threat posed by the presence of contaminated ground water. The Agency believes that property buy-outs are not warranted at this site as there are no significant adverse public health effects which are not addressed by the recommended remedy.

° Protection/cleanup of Slatersville Reservoir: one commenter requested EPA "remove the heavy oily layer which floats on the water." WSGCC endorses applying EPA drinking water quality standards to reservoir.

° The citizens voiced concerns that there was limited sampling data on the reservoir. In response, DEM conducted a round of surface water sampling, including the reservoir, in April 1984. The monitoring data from the mouth of the reservoir indicates that there is neither an environmental nor public health risk associated with any contamination of the reservoir (latest resevoir sampling was below detection levels for any contaminants).

° Aquifer protection: WSGCC endorses applying EPA drinking water quality standards to aquifer.	° Contaminated ground water has already moved off-site to the downgradient neighborhood and reservoir. However, a study to focus on the technological feasibility of recapturing that part of the escaped plume and treating it will be conducted. Installation of a clean permanent water supply will abate any present public health problems associated with drinking contaminated water from wells located in the aquifer.
REMAINING COMMUNITY CONCERNS	
° Temporary point-of-use-water treatment: advocated by WSGCC. Want carbon filtration system and free installation and maintenance.	° On reevaluating the homes determined to have contaminated private well water, EPA supports providing temporary water supply treatment (for total home use) to nine residences that have exhibited contamination at least once in their sampling history.

VI.

STATE COMMENTS

- Permanent water supply to 60 land parcels.
- Temporary water supply to individuals with contaminated water.
- Removal of 1600 to 500 cubic yards of contaminated soil, including pit #3, plus contingency for more removal. Make determination based on first excavations.
- Two year minimum for phase-out of groundwater recircualtion system. Phase-out not be done until non-aqueous layer contaminants no longer removed or until permanent water in place, if no temporary water provided.
- Loaming and seeding of lagoon area, in addition to site grading.
- Fencing: agree with this FS recommendation for fencing perimeter of site.
- Warning signs around perimeter of site and at brook, swamp, and mouth reservoir.
- Monitoring program to include wells, brook, swamp, reservoir, and continue until "sustained and substantial" decrease in contaminants.

EPA RESPONSE

- The State comments concerning alternative water supplies have been addressed in the body of the Record of Decision. In addition, a number of comments were similar to community comments; see previous "Community Comments" section for specific responses.

VII.

GENERATOR COMMENTS	EPA RESPONSE
° Public Water supply:	
1. Need not supported by RI/FS. Study does not present sufficient data to support finding that site poses a present or potential threat to public health. Model that was used to predict health risks not useful for making predictions of contaminants levels at some future point in time for estimating health risks.	1. The basis for EPA's conclusions on threats due to contaminated ground water is discussed in the ROD.
2. Extent of "affected" area overstated. Includes three domestic wells on Douglass Pike. "Highly unlikely" that site is source of contamination in those wells. May have been from domestic disposal or septic tank cleaners. Affected area should be redefined based on contours of groundwater plume. Size is 1/3 to 1/2 exaggerated.	2. Although the precise extent of the plume is difficult to define, EPA has a reasonable basis for including the Douglas Pike wells.
3. Estimated water demand of 500,000 gal/day exaggerated. 25,000 gal/day more than adequated to supply affected area. No CERLCA requirement that remedial action provide benefits beyond those necessary to mitigate and minimize damage to public health and the environment; therefore, no need for fire protection capability.	3. The size of pipes used in the system is based on standard technical considerations, not on alleged exaggerated demand projections. Including fire protection as part of the alternate water system increases the cost of the system by only 4.6%, as discussed in the ROD.
4. Not shown to be "feasible for the location" as required by National Contigency Plan. Determination of feasibility requires thorough analysis of available water sources for that water supply system.	4. After analysis, EPA has determined that there are several available water sources for the alternative water supply system.

5. Removal of Contaminated soil: recommended off-site disposal 400 cubic yards, and site grading.	5. It is EPA's judgement that removal of all the most heavily contaminated soil is necessary to protect against continued ground water deterioration. Based on the contractors estimate, it appears that the amount of higly contaminated wastes is considerably greater than 400 cubic yards. This estimate will be finalized after additional data is developed. EPA believes that unless all contaminated soil is removed (which would probably not be cost effective) site capping would be a necessary part of final closure of the sites.
6. Fencing: recommend fencing, but do not specify area.	6. Discussed in ROD
7. Monitoring: long-term monitoring not cost effective; if permanent public water supply is installed, threat will have been eliminated.	7. Monitoring will be addressed in a subsequent ROD. Long-term monitoring, consistent with RCRA Part 264, is necessary and appropriate to ensure that the source control measures which are selected are and continue to be effective.
8. Point-of-use water treatment: recommend for "those domestic wells that have exhibited consistent levels of contamination," (three at present). Rationale for dismissing this option was not presented in RI/FS.	8. Discussed in ROD.
9. Phase-out of ground water recirculation system: recommended but time frame not specified.	9. EPA agrees with this comment. This issue will be addressed in a subsequent ROD.